

APPLICATION FOR UNITED STATES LETTERS PATENT

FOR

**Common Design For Web Pages
Through Employment Of Master Specifications**

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**Common Design For Web Pages Through Employment Of Master
Specifications**

BACKGROUND OF THE INVENTION

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1. **Field of the Invention**

The present invention relates to the field of data processing. More specifically, the present invention relates to the efficient creation and maintenance of a common design for a web site or web based applications.

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2. **Background Information**

With advances in integrated circuit, microprocessor, networking and communication technologies, increasing number of devices, in particular, digital computing devices, are being networked together. As a result of this trend of increased connectivity, increasing number of applications that are network dependent are being deployed. Examples of these network dependent applications include but are not limited to, email, net-based telephony, world wide web (WWW) and various types of web based e-commerce, commonly referred to as web sites or web based applications. Further, increasing number of software applications that were traditionally licensed or distributed through discrete distribution medium, such as diskettes, CDROMs and the like, are being distributed online or offered as web based applications, through private intranets or public networks like the Internet.

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Conventionally, web pages of most web sites or web-based applications are typically coded using a mark up language, such as HTML or XHTML. The associated processing logic is typically implemented using a "script" language such as CGI, Javascript, Perl and so forth. Most web sites or web based applications, for

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at least aesthetic and/or usability reasons, desire a common design, that is having a consistent approach to at least styling elements, such as fonts, color schemes and so forth, and navigation among the pages.

Current prior art approaches to effectuate a common or consistent design to a web site or a web based application are inefficient. **Figure 1** illustrates one such technique. As illustrated, a designer would create navigation page **102** having a navigation arrangement specified in <body> section **114** (which functions as a “content” section). The style elements, such as font, color, and so forth would be specified in <head> section **112** (which functions as a “control” section). These style elements may be explicitly enumerated, or in the alternative, a reference to a style sheet containing these definitions may be specified instead. To effectuate the common design, the designer or designers would replicate (e.g. through cut and paste) the same style specification in each <head> section **132** of each page **104**. Further, navigation page **102** would be referenced as content source in one of the <frame> sections **136** of <body> section **134** of each page. The substantive content of each page would be specified employing one or more other <frame> sections **138**.

As can be seen, the style and navigation information, at least the references to their definitions, are maintained in each page **102-104**. Accordingly, if certain changes are to be made in one or more style elements or the navigation arrangement of the web site or web-based application, the changes must be made in each and every one of the web pages carrying the information. The process, is cumbersome and error prone. This is true, whether the changes are made with the employment of certain web development tool that can automatically ripple the changes to each and every web page, or through a cut and paste approach.

Alternatively, the common design may be effectuated through what is known in the art as “server side includes” (SSI). However, SSI requires one main URL to be employed for all links of a web site or a web-based application. The requirement makes URLs difficult to understand, and as a result makes building links to pages
5 more difficult. Further, the approach makes it very difficult for each page to have custom content in the <head> section. Moreover, if all pages of a web site or a web based application use SSI to define the “common areas”, the pages would have to be changed whenever the shape of the common area changes.

Thus, a more efficient approach to facilitating a common design for a web site
10 or web based application is desired.

SUMMARY OF THE INVENTION

A master specification is provided to specify a common design for a number of resultant web pages to be generated. The common design includes common content placement, and at least one of a common style and a common navigation arrangement. The content of a first resultant web page is defined employing a first subordinate web page specification, including reference to the master specification for content placement, and at least one of style and navigation. The content of a second resultant web page is similarly defined. In turn, the first and second resultant web pages are generated with first and second contents being placed, styled and/or having the common navigation arrangement in accordance with the master specification.

In one embodiment, the master specification, as well as both the first and second subordinate web page specifications, are expressed using the XHTML language. The style and/or navigation arrangement are specified in the <head> section. The common placement is specified in the <body> section. Both the first and second subordinate web page specifications also specify other control information in the <head> section. Each of the generation of the first and second resultant web pages includes merging the <head> sections of the master specification and the corresponding one of the first and second subordinate web page specifications.

In one embodiment, the first and the second resultant web pages are referenced by first and second URLs respectively, and the merged specifications

defining the first and second resultant web pages are dynamically generated when the first and second resultant web pages are requested, respectively.

5 BRIEF DESCRIPTION OF DRAWINGS

The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings in which like references denote similar elements, and in which:

10 **Figure 1** illustrates a prior art approach to effectuating a common design among web pages of a web site or web based application;

Figure 2 illustrates the present invention, including the master specification, to effectuate a common design among web pages, in accordance with one embodiment;

15 **Figure 3** illustrates the relevant operational flow of generator of **Fig 2**, incorporated with the teachings of the present invention to generate a web page using a master specification; and

Figure 4 illustrates an internal component view of a computer system suitable for use to practice the present invention, in accordance with one
20 embodiment.

DETAILED DESCRIPTION OF THE INVENTION

In the following description, various aspects of the present invention will be described. However, it will be apparent to those skilled in the art that the present invention may be practiced with only some or all aspects of the present invention. For purposes of explanation, specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the present invention. However, it will also be apparent to one skilled in the art that the present invention may be practiced without the specific details. In other instances, well-known features are omitted or simplified in order not to obscure the present invention.

Parts of the description will be presented in terms of operations performed by a processor based device, using terms such as data, style, navigation, links, and the like, consistent with the manner commonly employed by those skilled in the art to convey the substance of their work to others skilled in the art. As well understood by those skilled in the art, the quantities take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, and otherwise manipulated through mechanical and electrical components of the processor based device; and the term processor include microprocessors, micro-controllers, digital signal processors, and the like, that are standalone, adjunct or embedded. Further, for the purpose of this application, the terms "web site" and "web based application" should be considered synonymous and interchangeable.

Various operations will be described as multiple discrete steps in turn, in a manner that is most helpful in understanding the present invention, however, the order of description should not be construed as to imply that these operations are necessarily order dependent. In particular, these operations need not be performed in the order of presentation. Further, the description repeatedly uses the phrase "in

one embodiment”, which ordinarily does not refer to the same embodiment, although it may.

Overview

5 Referring now to **Figure 2**, wherein a block diagram illustrating the present invention for creating and maintaining a common design among web pages through the employment of a master specification, in accordance with one embodiment, is shown. As illustrated, in accordance with the present invention, master specification **202** is employed to control the common design of a number of web pages to be
10 generated. The common design includes content placement, and at least one of style and navigation. As alluded earlier, content placement refers to the spatial placement of substantive content in a web page, whereas style refers to style elements such as fonts, color and so forth. Navigation refers the supported transitions between the web pages. As will be readily apparent from the description
15 to follow, by virtue of the employment of master specification **202**, control, and in particular, updating or making modification to the common design become much easier, without many of the prior art disadvantages discussed earlier.

As shown, master specification **202** includes <head> section **212** and <body> section **214**. Specified in <head> section **212** is the style specification and/or
20 navigation specification for the common design of the web pages. As described earlier, specification of the style may be expressly made through explicit enumeration of the style elements. In the alternative, specification of the style may be implicitly made through a specification of a style sheet. Similarly, navigation may be explicitly defined or by reference to a navigation specification, wherein the common navigation
25 scheme is defined. The common navigation scheme may be laid out in any one of a

number of conventional designs, including but are not limited to horizontal and vertical layouts.

Specified in the <body> section **214** is the spatial placement of content, and more importantly, the content or the source of the content is to be specified by a subordinate web page specification. A subordinate web page specification is a web page specification that references master specification **202**, and deferring to master specification **202** for content placement, and at least one of style and navigation.

As illustrated, each of subordinate web page specifications **204/206** includes at least <head> section **222/232** and <body> section **224/234**. Specified in <head> section **222/232** is master specification **202** to which subordinate web page specification **204/206** defers to in terms of content placement and at least one of style and/or navigation for the web page being specified. However, under the present invention, notwithstanding the deferral to master specification **202**, each subordinate web page specification **204/206** may specify additional controls in <head> section **222**. Specified in <body> section **224/234** is the substantive content of the respective web page being specified.

Thus, when multiple web pages are “realized” by combining the substantial content as defined by the corresponding subordinate web page specifications, such as specifications **206** and **208**, and the common design specified by master specification **202**, a collection of web pages having a common design, the design specified by master specification **202**, results.

Continuing to refer to **Fig. 2**, while for ease of understanding, only one content placement **214** is shown for master specification **202**, as those skilled in the art would appreciate, the present invention may be practiced with master specification **202** having one or more content placements **214**. The content of each content placement **214** is sourced from a content source defined by a subordinate web page

specification **204**. Further, variable controls may be specified for the common design in the control (<head>) section **212** of master specification **202**, with the control values for the variable controls to be supplied by the referencing subordinate web page specifications **204**.

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For the illustrated embodiment, realization of such web pages is achieved by providing master specification **202** and the subordinate web page specifications **204-206** to generator **240**, which in response generates merged specifications for the resultant web pages. The resultant web pages are in turn rendered in accordance with the merged specifications. In a preferred embodiment, each resultant web page is referenced by its own uniform resource locator (URL), and the generation of the merged specification for the resultant web page is performed, when the resultant web page is requested. That is, the merged specifications, and in turn, the resultant web pages are generated on demand, in real time, on an as needed basis.

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Accordingly, there isn't an inventory of pre-generated web page specifications. Thus, when the common design changes, or updates/modifications to the common design are necessary, the updates/modifications may be made without having to ripple the changes through a large number of web page specifications. More importantly, by having master specification **202** control spatial placement of the substantive content specified by the subordinate web page specifications, no modifications to the web page specifications are necessary, when the "common area" changes in size and/or shape.

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Figure 3 illustrates the relevant operational flow of generator **240** for generating a merged specification for a resultant web page on demand employing master specification **202**. As illustrated, upon invocation, generator **240** first adopts

<head> section **212** of master specification **202** (block **302**). Next, generator **240** merges the additional control information specified in <head> section **222** of subordinate web page specification **204** into the adopted <head> section (block **304**). Accordingly, the earlier described additional supplemental specification of control
5 information by a subordinate web page specification may be effectuated.

Thereafter, generator **240** adopts <body> section **214** of master specification **202** (block **306**). As before, generator **240** merges the substantive content specified in <body> section **224** of subordinate web page specification **204** into the adopted <body> section (block **308**). Accordingly, the earlier described placement of content
10 under the control of master specification **202** may be effectuated.

Generator **240** may be implemented in any one of a number of programming instructions known in the art. In one embodiment, generator **240** is implemented as a “standalone” utility. In another embodiment, generator **240** is implemented as an integral function of a web server.
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Example Computer System

Figure 4 illustrates an example computer system suitable for use to practice the present invention in accordance with one embodiment. As shown, computer system **400** includes one or more processors **402** and system memory **404**.

20 Additionally, computer system **400** includes mass storage devices **406** (such as diskette, hard drive, CDROM and so forth), input/output devices **408** (such as keyboard, cursor control and so forth) and communication interfaces **410** (such as network interface cards, modems and so forth). The elements are coupled to each other via system bus **412**, which represents one or more buses. In the case of
25 multiple buses, they are bridged by one or more bus bridges (not shown). Each of these elements performs its conventional functions known in the art. In particular,

system memory **404** and mass storage **406** are employed to store a working copy and a permanent copy of the programming instructions implementing the “generator” function of the present invention (or a component incorporating the “generator” function). The permanent copy of the programming instructions may be loaded into
5 mass storage **406** in the factory, or in the field, as described earlier, through a distribution medium (not shown) or through communication interface **410** (from a distribution server (not shown). The constitution of these elements **402-412** are known, and accordingly will not be further described.

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Conclusion and Epilog

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Thus, an improved method and apparatus for effectuating a common design among web pages has been described. While the present invention has been described in terms of the above illustrated embodiments, those skilled in the art will recognize that the invention is not limited to the embodiments described. The present
invention can be practiced with modification and alteration within the spirit and scope of the appended claims. Thus, the description is to be regarded as illustrative instead of restrictive on the present invention.